Space Weather Forecast

Issued on Monday, 13 November 2023 at 13:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storms on Day 1 (13 Nov) due to coronal hole. Chance of Moderate-class flares, declining through the period.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low with only Common-class flares in the last 24 hours. There are currently six sunspot regions on the disc. The largest region is in the northwest of the disc, perhaps with some minor magnetic complexity, however this is getting more difficult to assess as it starts to approach the limb. In the south-centre disc a region has appeared to have stabilised. A new region has appeared in the southwest. The other regions appear relatively stable - but as with all regions approaching the west limb the analysis becomes more difficult. No new Earth-directed Coronal Mass Ejections (CMEs) have been observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds showed a CME arrival around 12/0530 UTC. Speeds have been easing through the past 24 hours, initially being Elevated at 540km/s after a CME arrival around 12/0530 but have now eased to ambient to slightly elevated levels at 400km/s. The total magnetic field strength (has been on average moderate but has recently fallen to weak. The north-south component was moderately northward, before rotating southwards just after 12/2200, becoming northwards again from 12/0200 before recently becoming mainly southward again. Geomagnetic activity was Quiet to Unsettled (Kp 1-3), but with a G1 minor storm (Kp5) at 250000/2503000.

Energetic Particles / Solar Radiation: Solar radiation levels remained at background levels.

Four-Day Space Weather Forecast Summary
Solar Activity: Four of the six sunspot regions currently on the disc are due to rotate off in the coming days. There is a gradually declining chance of Moderate-class flares occurring through the period, becoming a slight chance by Day 3 (15 Nov).

Solar Wind / Geomagnetic Activity: A faint and slow CME was observed leaving the Sun late on 10 Nov. There is a chance of a glancing blow on Day 3 (15 Nov) but with very limited impacts expected. Current wind speeds are approaching background ambient levels, effects from a coronal hole may cause slightly elevated wind speeds at times Day 1 and perhaps into Day 2 (13 and 14 Nov).
Overall, geomagnetic activity may be Unsettled to Active with a chance of isolated G1/Minor Storm intervals at first from any interaction from a coronal hole. This gradually easing through Day 2 (13 Nov) to be Quiet to Unsettled for much of the rest of the period. Active intervals are possible on Day 3 should we see a glancing CME arrival.

Energetic Particles / Solar Radiation: There is a slight chance of S1 or greater radiation storm conditions should any of the western hemisphere sunspot groups produce significant flares in the period. This risk will wane through the period as these sunspots rotate well away from the western limb.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	25	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	20	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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